

**REMARKS**

Applicant thanks the Examiner for withdrawing most of the rejections of record in the February 20, 2004 Office Action.

**Status of the Application**

Claims 1-19, 21 and 23-37 are all the claims pending in the Application. Claims 1-19, 21 and 23-37 have been rejected. Claims 8, 19, 24 and 31 are hereby amended in a clarifying, non-limiting, manner.

**Indefiniteness Rejection**

The Examiner has rejected claims 19 and 24 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. The alleged informalities in dependent claims 19 and 24 are hereby corrected by way of clarifying, non-limiting, amendments. Thus, withdrawal of the rejection is respectfully requested.

**Claim Objections**

The Examiner has objected to claim 8 under 37 C.F.R. § 1.75(c) as allegedly being in improper dependent form. The alleged informality cited by the Examiner has been corrected by way of a clarifying, non-limiting, amendment. Thus, withdrawal of the objection is respectfully requested.

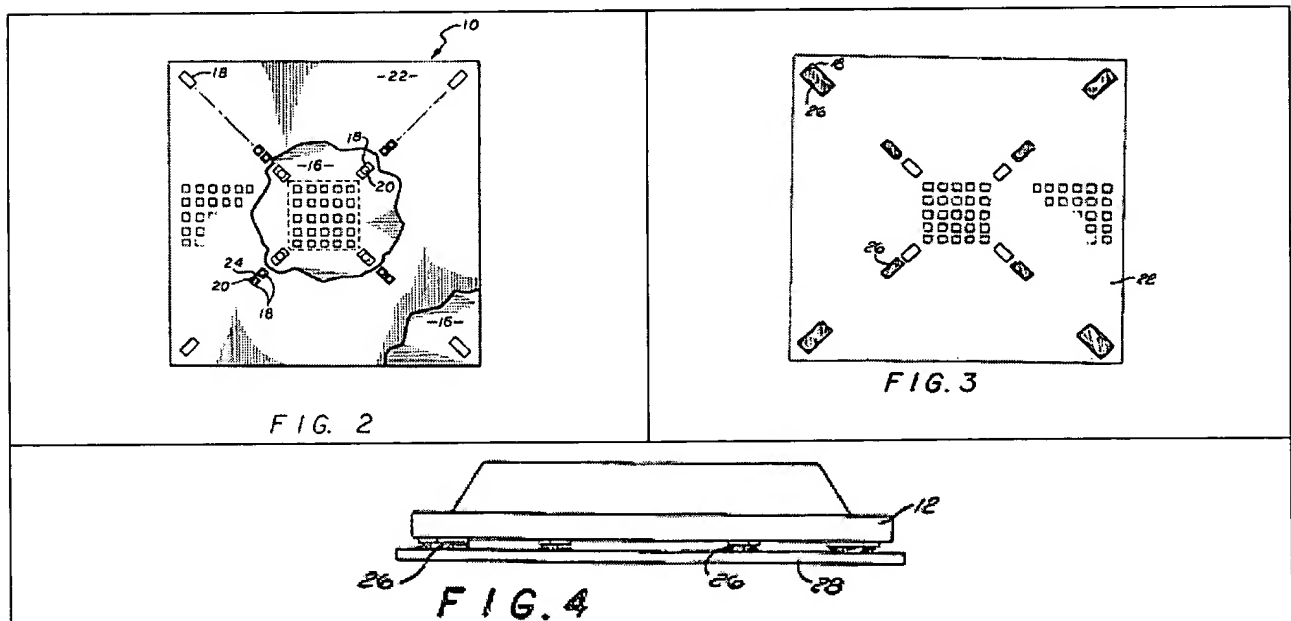
**Claim Rejections**

The Examiner has rejected: (1) claims 1, 2, 4-6, 13-15, 21 and 25-29 under 35 U.S.C. § 102(e) as being anticipated by *Barrow* (US 6,118,182; hereinafter "*Barrow*"); (2) claims 3, 27 and 29 under 35 U.S.C. § 103(a) as being unpatentable over *Barrow* in combination with *JP 10-*

56093 (hereinafter *JP '093*); (3) claims 23 and 24 under 35 U.S.C. § 103(a) as being unpatentable over *Barrow*; (4) claims 7-12, 16-19 and 27-37 under 35 U.S.C. § 103(a) as being unpatentable over *Barrow* in combination with *JP 10-303249* (hereinafter "*JP '249*"); (5) claims 1, 2, 4-8, 10-19, 21 and 23-37 under 35 U.S.C. § 103(a) as being unpatentable over *Dockerty et al.* (US 5,796,169; hereinafter "*Dockerty*") in combination with *Barrow*; and (6) claims 3, 9, 27-29 and 34-36 under 35 U.S.C. § 103(a) as being unpatentable over *Dockerty* in combination with *Barrow* and *JP '093*. These rejections are respectfully traversed.

*Independent Claim 1 Is Patentable over Barrow*

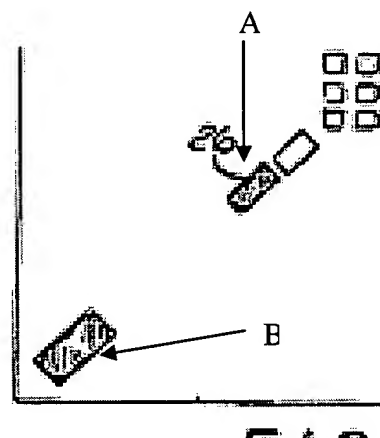
*Barrow* discloses an integrated circuit package with rectangular contact pads 18. The sole disclosed embodiment is illustrated in Figures 2-4, which are reproduced below for convenience.



*Barrow* discloses that contact pads 18 each have a rectangular shape extending along a diagonal axis of the substrate 12 (col. 2, lines 18-25). Solder balls 20 are then attached to the contact pads 18 and reflowed to form solder joints 26.

*Barrow* only discloses the arrangement of two types of these solder joints 26, identified by letters A and B in the enlarged portion of Figure 3 reproduced to the right.

Although Applicant notes that it has long been held that when the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value,<sup>1</sup> Applicant will assume, for the sake of this discussion only, that the solder bump A is not as large as the solder bump B. Applicant respectfully submits that this assumption is the only remotely reasonable way to interpret *Barrow*.



In any event, it is clear that solder bump B is connected to a single contact pad 18 (see the outermost contact pad in Figure 2), while solder bump A is connected to two contact pads 18 (see Figure 2).

Turning to the instant *Office Action*, the Examiner takes the position that *Barrow* discloses all of the features of claim 1, specifying (see the paragraph bridging pages 4 and 5 of the *Office Action*) that *Barrow* shows:

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<sup>1</sup> See *Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, USPQ2d 1487, 1491 (Fed. Cir. 2000); MPEP § 2125.

integration possible electrodes 18 and general electrodes 18; a plurality of the said integration possible electrodes are arranged adjacently to each other to form a group of integration possible electrodes; the group of integration possible electrodes is connected to a single first solder bump “robust solder joint” 26; each of the general electrodes are individually connected to a single second solder bumps 26; the first solder bump is larger than each of the second solder bumps.

Further, the Examiner also alleges that (see Office Action, first full paragraph on page 7 of the *Office Action*):

To further clarify the disclosure that the first solder bump is larger than each of the second solder bumps, Barrow discloses that the first bump comprises two second bumps; therefore, it is larger than the second bumps.

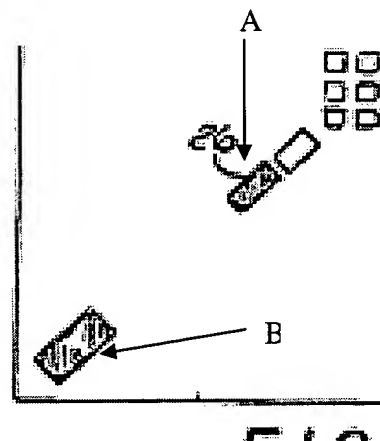
Applicant respectfully disagrees with the Examiner’s reading of *Barrow*, and again respectfully submits that *Barrow* fails to teach or suggest that: “a plurality of the integration possible electrodes are arranged adjacently to each other to form a group of integration possible electrodes; the group of integration possible electrodes is connected to a single first solder bump; each of the general electrodes are individually connected to single second solder bumps; [and] the first solder bump is larger than each of the second solder bumps,” as recited in independent claim 1.

Specifically (at least as the Applicant understands the instant *Office Action*), the Examiner has alleged that solder joints 26 of *Barrow* are comparable to the “first solder bump” and “second solder bumps” recited in claim 1. However, the Examiner does not otherwise specify which of the solder joints 26 he believes correspond to the respective first and second solder bumps.

In any event, as discussed above, *Barrow* only discloses the arrangement of two types of these solder joints 26, identified by letters A and B in the enlarged portion of Figure 3 reproduced to the right.

Further, as discussed above, *Barrow* only discloses that solder joint A is connected to multiple contact pads 18.

There is no teaching or suggestion in *Barrow* that solder joint B is connected to anything other than a single contact pad 18 (see Figure 2).



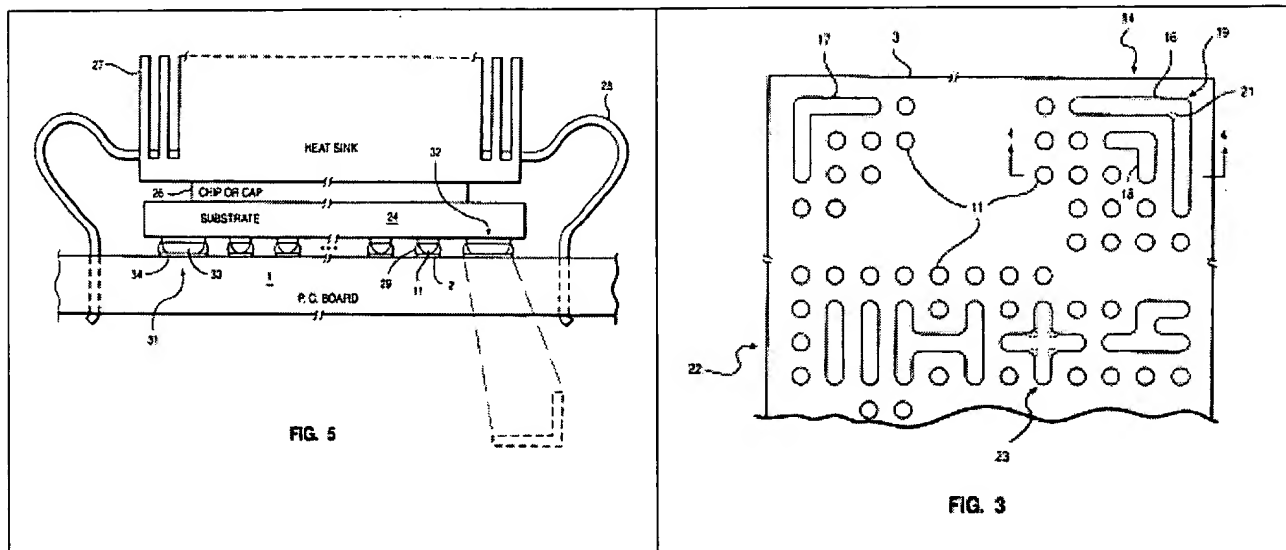
This distinction is important, as independent claim 1 specifies that a single, larger, first solder bump is connected to multiple electrodes, while multiple, smaller, second solder bumps are individually connected to single electrodes.

In contrast, *Barrow* discloses the exact opposite relationship, as the only reasonable interpretation (if one can be formulated) of FIG. 3 of *Barrow* is that solder joint B is larger than solder joint A, and that the larger solder joint A is connected to only one electrode (rather than multiple electrodes as recited in claim 1), while the smaller solder joint B is connected to multiple electrodes (rather than singly to individual electrodes as recited in claim 1).

Thus, it cannot reasonably be argued that *Barrow* teaches or suggests all of the features of independent claim 1, and Applicants respectfully request that this rejection of independent claim 1 be withdrawn.

Independent Claim 1 Is Patentable Over Any Reasonable Combination of Dockerty and Barrow

*Dockerty* discloses a reinforcement structure for a ball grid array connected integrated circuit device (col. 1, lines 12-18) utilizing L-shaped support elements (*e.g.*, under elements 16 and 17 in Figure 3). The sole disclosed embodiment is illustrated in Figures 3 and 5, which are reproduced below for convenience.



More specifically, *Dockerty* discloses that (see Figure 3) “L-shaped support elements, generally at 14, are added to the corner regions of the integrated circuit device ball grid array surface” of an integrated circuit device 3. *Dockerty* further discloses that these support elements, such as support solders 16 and 17, extend over multiple solder ball spacing increments (*i.e.*, that their length is equivalent to several increments between other solder balls 11, not that they are connected to multiple electrodes). These support solders (*e.g.*, elements 16 and 17) are individually supported by single L-shaped bonding pads (*e.g.*, element 15), as shown in detail in Figure 5 (see wider pad on which support solder 33 is arranged).

The Examiner takes the position that *Dockerty* discloses (O.A., pg. 15):

A back electrode electronic part comprising: a main body 3; a circuit; and electrodes arranged on an outer back surface of the main body; wherein; the electrodes comprise inherently integration possible electrodes 15 and general electrodes 14; a plurality of the said integration possible electrodes are arranged adjacently to each other to inherently form a group of integration possible electrodes; the integration possible electrodes are connected to a single first solder bump 16/33; each of the general electrodes are individually connected to single second solder bumps 11; the first solder bump is larger than each of the second solder bumps ...

Thus, although it is not entirely clear, it seems that the Examiner is alleging that all of the features of independent claim 1 are disclosed by *Dockerty*. However, on page 21 of the Office Action, the Examiner alleges that *Barrow* can be applied to show that:

Each of the integration possible electrodes 18 that are part of the group of integration possible electrodes inherently have a substantially same potential level when said circuit operates because they are electrically interconnected by bump 26.

Further, the Examiner alleges that:

It would have been obvious to combine the bump interconnected electrodes of *Barrow* with the product, including the first solder bump 16/33 of *Dockerty*, because it would facilitate the disclosure of *Dockerty* of “a continuum of solder extending from one solder ball to a succeeding located solder ball,” support elements ... extend ... over multiple solder ball spacing increments. For example, support solder 16 extends over 4 solder spacing increments while support solder 17 extends over three increments. Support solder 18 only extends one solder ball increment in each axial direction while remaining symmetrically within the range of the pattern defined by support solder 16.

Thus, although it is not entirely clear, Applicants believe that the Examiner is applying, alternatively, either: (1) *Dockerty* alone; or (2) *Dockerty* in some combination with *Barrow*, against independent claim 1. In either case, Applicants respectfully disagree with the current rejection.

First, Applicants respectfully submit that *Dockerty* fails to teach or suggest any “electrodes connected to a single first solder bump,” as recited in claim 1.

Specifically, the Examiner’s allegation that the recited first solder bump is somehow equivalent to support solder 16 or 33 is simply incorrect. There is no teaching or suggestion in *Dockerty* that support solder 16 or 33 is in any way connected to multiple electrodes. Rather, support solder 16 and 33 is connected to a single large electrode (see support solder 33’s connections in FIG. 5). Thus, *Dockerty* only discloses a one-to-one connection between electrodes and solder bumps.

Second, Applicant respectfully submits that one of ordinary skill in the art at the time of the invention (“one of ordinary skill”) would not have been motivated to modify *Dockerty* in view of *Barrow* as the Examiner has alleged. It has long been held that the Examiner must “show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for a combination in the manner claimed.” *In re Rouffet*, 47 USPQ2d 1453 (Fed.Cir. 1998). The mere fact that references can be “combined or modified does not render the resultant combination [or modification] obvious unless the prior art also suggests the desirability of the combination [or modification].” *In re Mills*, 916 F.2d 680 (Fed.Cir. 1990); MPEP §2143.01.

Here, *Dockerty* and *Barrow* disclose mutually exclusive alternative methods of strengthening a ball grid array connection. *Dockerty* utilizes large L-shaped support solders 16 to provide a one-to-one connection to a large L-shaped electrode, arranged amongst smaller one-to-one connections between solder balls 11 and their supporting electrodes. In contrast, *Barrow*

utilizes a diagonal arrangement of rectangular electrodes and solder bumps that are not arranged amongst other solder balls and/or supporting electrodes.

Applicant respectfully submits that there is no teaching or suggestion that these alternative constructions could ever, or would ever, be used together, and no teaching or suggestion of any improvement that would be offered to *Dockerty* by utilizing the disclosure of *Barrow*. Hence, there is no teaching or suggestion that the combination would be desirable, and therefore no motivation for one of ordinary skill to have modified the references as alleged by the Examiner.

Further, even if it were possible to modify *Dockerty* in view of *Barrow* as the Examiner has alleged, Applicants respectfully submit that neither *Dockerty*, *Barrow*, nor any reasonable combination thereof, teaches or suggests that “a plurality of the integration possible electrodes are arranged adjacently to each other to form a group of integration possible electrodes; the group of integration possible electrodes is connected to a single first solder bump; each of the general electrodes are individually connected to single second solder bumps; [and] the first solder bump is larger than each of the second solder bumps,” as recited in independent claim 1.

Specifically, as discussed above, *Dockerty* only discloses that support solder 16 and 33 are individually connected to a single large electrode. Thus, *Dockerty* only discloses a one-to-one connection between solder balls and electrodes.

Further, as discussed above, *Barrow* discloses the exact opposite relationship of that claimed, as the only reasonable interpretation (if one can be formulated) of FIG. 3 of *Barrow* is that solder joint B is larger than solder joint A, and that the larger solder joint A is connected to

only one electrode (rather than multiple electrodes as recited in claim 1), while the smaller solder joint B is connected to multiple electrodes (rather than singly to individual electrodes as recited in claim 1). Further, *Barrow* discloses a specific arrangement where the electrodes 18 that are connected by a single solder joint 26 are arranged directly adjacent to each other, not in a the grid pattern of electrode/solder balls 11 of *Dockerty*.

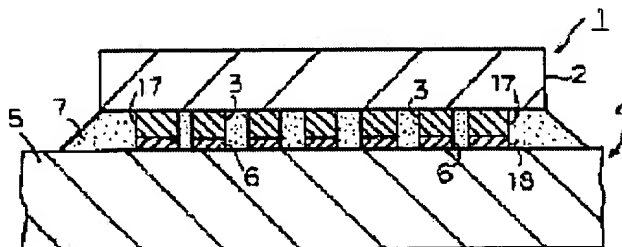
Thus, even if *Dockerty* were modified in view of *Barrow*, there is no teaching or suggestion that any of the electrodes of *Dockerty* could be interconnected by a single solder ball, as they are not configured to be directly adjacent, such as in the structure of *Barrow*. There is simply no teaching or suggestion in *Barrow* that single solder ball can bridge the distance between the electrodes (under solder balls 11) of *Dockerty*. Accordingly, even a combination of *Barrow* and *Dockerty* would fail to teach or suggest any structure where a larger solder ball would be connected to multiple electrodes and smaller solder balls would be connected to individual electrodes.

Thus, Applicant respectfully requests the withdrawal of this rejection.

*Independent Claim 7 Is Patentable Over Any Reasonable Combination of Barrow and JP '249*

The Examiner alleges that a combination of *Barrow* and *JP '249* obviates the features of independent claim 7.

*Barrow* is discussed in detail above. *JP '249* discloses a system using semiconductor pellet 1 with multiple electrodes 3 arranged along a periphery thereof, and wiring board 4



with pad electrodes 6 arranged along a periphery thereof. Corner electrodes 17 and 18 are provided at the corners of the respective electrode arrangements to face each other, and have a larger diameter than the other electrodes 3 and 6. The respective electrodes 3/6 and 17/18 have heights and are directly connected without solder bumps, as shown in FIG. 1, reproduced to the right.

The Examiner alleges that many of the features of independent claim 7 are disclosed by *Barrow* (O.A., pgs. 11-12), but that *Barrow* fails to teach or suggest a printed circuit board with electrodes. Applicant agrees that *Barrow* is deficient in this regard.

In an attempt to show that such features were known, the Examiner cites *JP '249*, taking the position that it discloses (O.A., pgs. 14-15):

substrate electrodes arranged on an outer surface of the printed circuit board 5, wherein: the substrate electrodes comprise a first substrate electrode 18 and second substrate electrode 6; said first substrate electrode is connected to a single first solder bump 17; each of said second substrate electrodes are individually connected to single second solder bumps 3; wherein said first substrate electrode of said printed circuit board is larger than each of said second electrodes of said printed circuit board. Moreover, it would have been obvious to combine the electrodes of [*JP '249*] with the product of *Barrow* because it would enable connection of the circuit board and bumps of *Barrow*.

Applicant disagrees with the above analysis, and respectfully submits that one of ordinary skill would not have been motivated to modify *Barrow* in view of *JP '249* as the Examiner has alleged.

*Barrow* is directed to the provision of solder joints 26 to connect substrate 12 to printed circuit board 28. In contrast, *JP '249* is directed to an embodiment that does not use solder

joints. Rather, *JP '249* uses opposing tall electrodes to form a direct connection. Thus, one of ordinary skill would not look to *JP '249* to modify the solder joints of *Barrow*.

Additionally, even if it were possible to modify *Barrow* in view of *JP '249* as the Examiner has alleged, Applicants respectfully submit that neither *Barrow*, *JP '249*, nor any reasonable combination thereof teaches or suggests “said group of integration possible electrodes and said first substrate electrode are connected to a single first solder bump; each of said general electrodes and each of said second substrate electrodes are individually connected to single second solder bumps; and said first solder bump is larger than each of the second solder bumps,” as recited in independent claim 7.

Specifically, as discussed above, *Barrow* discloses the exact opposite relationship of that claimed, as the only reasonable interpretation (if one can be formulated) of FIG. 3 of *Barrow* is that solder joint B is larger than solder joint A, and that the larger solder joint A is connected to only one electrode (rather than multiple electrodes as recited in claim 7), while the smaller solder joint B is connected to multiple electrodes (rather than singly to individual electrodes as recited in claim 7).

Thus, it cannot reasonably be argued that *Barrow* teaches or suggests connecting larger solder bumps to a group of integration possible electrodes and smaller solder bumps to individual general electrodes.

*JP '249* is no more relevant in this regard, as it too only discloses a one-to-one relationship between opposing electrodes, and fails even to teach or suggest the use of solder bumps.

Thus, Applicant respectfully requests that the Examiner withdraw the current rejections of claim 7.

*Independent Claim 7 Is Patentable Over Any Reasonable Combination of Dockerty and Barrow*

The Examiner alleges that a combination of *Dockerty* and *Barrow* obviates the features of independent claim 7. Applicant respectfully disagrees.

Applicant respectfully submits that one of ordinary skill would not have been motivated to modify *Dockerty* in view of *Barrow*, at least for the reasons discussed above with respect to independent claim 1.

Additionally, even if it were possible to modify *Dockerty* in view of *Barrow* as the Examiner has alleged, Applicants respectfully submit that neither *Dockerty*, *Barrow*, nor any reasonable combination thereof, teaches or suggests that the “group of integration possible electrodes and said first substrate electrode are connected to a single first solder bump; each of said general electrodes and each of said second substrate electrodes are individually connected to single second solder bumps; and said first solder bump is larger than each of the second solder bumps.”

Specifically, as discussed above with respect to independent claim 1, neither *Dockerty*, *Barrow*, or any combination thereof teaches or suggests any structure where a larger solder ball would be connected to multiple electrodes and smaller solder balls would be connected to individual electrodes.

Thus, Applicant respectfully requests that the Examiner withdraw this rejection.

*Independent Claim 19 Is Patentable Over Any Reasonable Combination of Barrow and JP '249*

The Examiner alleges that a combination of *Barrow* and *JP '249* obviates the features of independent claim 19. Applicant respectfully disagrees.

First, Applicant respectfully submits that one of ordinary skill would not have been motivated to modify *Barrow* in view of *JP '249*, at least for the reasons discussed above with respect to independent claim 7.

Second, even if it were possible to modify *Barrow* in view of *JP '249* as the Examiner has alleged, Applicants respectfully submit that neither *Barrow*, *JP '249*, nor any reasonable combination thereof, teaches or suggests a back electrode part comprising “at least two first electrodes positioned on an outer rear surface of said electronic part and connected to a first solder bump; at least one second electrode positioned on the outer rear surface of said electronic part and connected to a second solder bump, wherein said first solder bump has a larger lateral cross section than said second solder bump.”

Specifically, neither *Barrow* nor *JP '249* can reasonably be argued as teaching or suggesting connecting larger solder bumps to a group of integration possible electrodes and smaller solder bumps to individual general electrodes, for at least the reasons discussed above with respect to independent claim 7.

Third, even if it were possible to modify *Barrow* in view of *JP '249* as the Examiner has alleged, Applicants respectfully submit that neither *Barrow*, *JP '249*, nor any reasonable combination thereof, teaches or suggests a back electrode part where “each of said first electrodes and second electrode are arranged in a matrix on said rear surface of said electronic

part so that the first electrodes are spaced apart by the same distance that the second electrode is spaced apart from a nearest one of the first electrodes.”

The Examiner concedes that *Barrow* fails to disclose such features (O.A., pg. 13).

Applicants agree that *Barrow* is deficient in this regard. Nevertheless, the Examiner alleges that the recited features “would have been an obvious matter of design choice” in view of *Barrow*. Applicant respectfully disagrees.

*Barrow* is specifically directed to: (1) the provision of elongated rectangular contact pads 18 that extend along the diagonal axes of a substrate 12 because these are the larger axes of expansion and contraction (col. 2, lines 18-30); and (2) the arrangement of pads 18 in close proximity to each other to effectively support a single small solder joint 26 (col. 2, lines 43-45). Any design choices in view of *Barrow* must keep these basic constructions in mind.

Thus, the Examiner’s proffered modification to modify *Barrow* to arrive at the claimed features by way of “obvious design choice” is unsupported. One of ordinary skill would not modify *Barrow* so as to move the pads arranged along the diagonal axes so that they would be arranged in a matrix, nor would one of skill modify the closely arranged pads 18 supporting a single small solder joint 26 so as to separate the pads, as this would be contrary to the basic disclosure of *Barrow*.

Further, Applicants respectfully submit that *JP ‘249* (which the Examiner has not cited for relevance to this claimed feature) is similarly deficient, as it only discloses perimeter electrodes (*i.e.*, not a matrix of electrodes). Further, *JP ‘249* also fails to provide the missing motivation for the Examiner’s proffered “obvious design choice,” as it does not teach or suggest

electrodes in a matrix, nor multiple electrodes connected by a single solder bump with which to modify *Barrow*.

Thus, Applicant respectfully requests the withdrawal of this rejection.

*Independent Claim 19 Is Patentable Over Any Reasonable Combination of Dockerty and Barrow*

The Examiner alleges that a combination of *Dockerty* and *Barrow* obviates the features of claim 19. Applicant respectfully disagrees.

First, Applicant respectfully submits that one of ordinary skill would not have been motivated to modify *Dockerty* in view of *Barrow*, at least for the reasons discussed above with respect to independent claim 1.

Second, even if it were possible to modify *Dockerty* in view of *Barrow* as the Examiner has alleged, Applicants respectfully submit that neither *Dockerty*, *Barrow*, nor any reasonable combination thereof, teaches or suggests a back electrode part comprising “at least two first electrodes positioned on an outer rear surface of said electronic part and connected to a first solder bump; at least one second electrode positioned on the outer rear surface of said electronic and connected to a second solder bump, wherein said first solder bump has a larger lateral cross section than said second solder bump.”

Specifically, neither *Dockerty* nor *Barrow* can reasonably be argued as teaching or suggesting any structure where a larger solder ball would be connected to multiple electrodes and smaller solder balls would be connected to individual electrodes, for at least the reasons discussed above with respect to claim 1.

*Independent Claim 21 Is Patentable Over Barrow*

The Examiner alleges that *Barrow* anticipates the features of claim 21. Applicant respectfully disagrees.

Applicant respectfully submits that *Barrow* fails to teach or suggest “at least one of said groups of electrodes is connected to a first solder bump which is larger than second solder bumps connected to said electrodes arranged other than in said groups of electrodes; the electrodes arranged other than in said groups of electrodes are each connected to only one second solder bump.”

Specifically, it cannot reasonably be argued that *Barrow* teaches or suggests connecting larger solder bumps to a group of integration possible electrodes and smaller solder bumps to individual general electrodes, for at least the reasons discussed above with respect to claim 1.

Thus, Applicant respectfully requests that the Examiner withdraw this rejection.

*Independent Claim 21 Is Patentable Over Any Reasonable Combination of Dockerty and Barrow*

The Examiner alleges that a combination of *Dockerty* and *Barrow* obviates the features of claim 21. Applicant respectfully disagrees.

First, Applicant respectfully submits that one of ordinary skill would not have been motivated to modify *Dockerty* in view of *Barrow*, at least for the reasons discussed above with respect to independent claim 1.

Second, even if it were possible to modify *Dockerty* in view of *Barrow* as the Examiner has alleged, Applicants respectfully submit that neither *Dockerty*, *Barrow*, nor any reasonable combination thereof, teaches or suggests “at least one of said groups of electrodes is connected to

a first solder bump which is larger than second solder bumps connected to said electrodes arranged other than in said groups of electrodes; the electrodes arranged other than in said groups of electrodes are each connected to only one second solder bump.”

Specifically, as discussed above, neither *Dockerty* nor *Barrow* can reasonably be argued as teaching or suggesting connecting larger solder bumps to a group of integration possible electrodes and smaller solder bumps to individual general electrodes, for at least the reasons discussed above with respect to claim 1.

Thus, Applicant respectfully requests that the Examiner withdraw this rejection.

Rejected Dependent Claims 2-6 and 8-18

Applicants respectfully submit that rejected dependent claims 2-6, 8-18 and 23-37 are allowable, *at least* by virtue of their dependency. Additionally, Applicant respectfully submits that dependent claims 2-6, 8-18 and 23-37 are separately patentable over the applied references.

For example, regarding claims 2 and 8, the Examiner alleges that *Barrow*, *JP '249* and *Dockerty*, either alone or in various combinations, disclose all of the features recited therein. Applicant disagrees, and respectfully submits that none of the applied references teach or suggest that the back electrode electronic part electrodes “are arranged in a matrix, and said group of integration possible electrodes is arranged at a corner of the matrix.”

As discussed in detail above, the only applied reference that in any way discloses a single solder joint that contacts multiple electrodes is *Barrow*. However, *Barrow's* solder joint 26 that contacts two pads 18 cannot reasonably be read as being arranged in any matrix, let alone at a corner of a matrix. *JP '249* and *Dockerty* are simply silent regarding such a feature.

Further, as discussed above with respect to claim 19, there would have been no motivation to modify the specific arrangement of *Barrow* in the manner proffered by the Examiner, as such a modification is contrary to *Barrow's* disclosure.

Additionally, regarding claims 3 and 9, the Examiner alleges that a combination of *Barrow* and *JP '093* (claim 3) or *Barrow*, *JP '093* and *Dockerty* (claim 9), disclose all of the features recited therein. Applicant disagrees, and respectfully submits that none of the applied references teach or suggest that “one of the integration possible electrodes that are part of said group of integration possible electrodes comprises a non-contact electrode which is not connected to said circuit.”

The Examiner concedes that *Barrow* (and *Dockerty*) fail to teach or suggest such features (O.A., pg. 9 and 23), but alleges that *JP '093* discloses noncontact electrodes 10, which could be provided in *Barrow* (or *Dockerty*) to improve connection strength.

However, Applicant respectfully submits that none of the applied references teach or suggest providing a non-contact electrode as part of a group of electrodes connected to a single solder joint. Rather, *JP '093* only discloses a non-contact electrode as being a stand alone feature, not as part of a group.

Additionally, regarding claims 23 and 30, the Examiner alleges that *Barrow* (claim 23) or a combination of *Dockerty* and *Barrow* (claim 30), disclose all of the features recited therein. Applicant disagrees, and respectfully submits that none of the applied references teach or suggest that “each of the electrodes” of the back electrode electronic part “are the same size.”

Although the Examiner concedes that neither *Barrow* nor *Dockerty* disclose the recited features, the Examiner alleges that providing electrodes of the same size would have been an obvious matter of design choice. Applicants disagree, as modification of *Barrow* or *Dockerty* to provide electrodes of the same size would be contrary to their specific disclosures.

Specifically, as discussed above with respect to claim 19, *Barrow* discloses smaller and larger electrodes 18 arranged along diagonal axes of a substrate 12. The shapes and sizes of these electrodes are particularly selected to function correctly in *Barrow*. The Examiner has cited no particular reason why modifying these features as proffered would be at all desirable.

Further, *Dockerty* discloses a specific embodiment that utilizes electrodes of different sizes (see Figure 3). Modification of *Dockerty* to change the sizes of these electrodes would completely change the functionality of *Dockerty*, and therefore no motivation would be found.

Additionally, regarding claims 25, 26, 32 and 33, the Examiner alleges that *Barrow* (claims 25 and 26) or a combination of *Barrow* and *Dockerty* (claims 32 and 33) disclose all of the features recited therein. Applicant disagrees, and respectfully submits that none of the applied references teach or suggest: (1) that “four integration electrodes” “form the group of integration possible electrodes” (claims 25 and 32); or (2) that “three integration electrodes” “form the group of integration possible electrodes” (claims 26 and 33).

As discussed above, the only reference that discloses any connection of multiple electrodes to a single solder bump is *Barrow*. However, *Barrow* only discloses that two electrodes 18 are arranged adjacently along a diagonal axis of a substrate 12 in order to be connected to a single solder joint 26. There is no teaching or suggestion in *Barrow* that

additional electrodes beyond the disclosed two could also be connected to solder joint 26.

*Dockerty* is silent regarding the connection of multiple electrodes to a single solder joint.

Additionally, regarding claims 27-29 and 34-36, the Examiner alleges that *Barrow, JP '093, JP '249* and *Dockerty*, either alone or in combination, disclose all of the features recited therein. Applicant disagrees, and respectfully submits that none of the applied references teach or suggest that “a first and second one of said integration possible electrodes” comprise: (1) “a ground electrode and a non-contact electrode, respectively” (claims 27 and 34); (2) “a signal electrode and a non-contact electrode, respectively” (claims 28 and 35); (3) a power electrode and a non-contact electrode, respectively (claims 29 and 36).

As discussed above with respect to dependent claims 3 and 9, none of the applied references teach or suggest providing a non-contact electrode as part of a group of electrodes connected to a single solder joint. Rather, *JP '093* and *JP '249* only disclose a non-contact electrode as being a stand alone feature, not as part of a group, particularly as part of a group with a ground, signal or power electrode.

### **Conclusion**

In view of the foregoing, it is respectfully submitted that claims 1-19, 21 and 23-37 are allowable. Thus, it is respectfully submitted that the application now is in condition for allowance with all of the claims 1-19, 21 and 23-37.


If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Amendment Under 37 C.F.R. § 1.116  
U.S. Appln. No.: 09/435,448

Attorney Docket # Q56857

Please charge any fees which may be required to maintain the pendency of this application, except for the Issue Fee, to our Deposit Account No. 19-4880.

Respectfully submitted,

  
\_\_\_\_\_  
Timothy P. Cremen  
Registration No. 50,855

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

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**23373**

CUSTOMER NUMBER

Date: November 4, 2004